

=> FILE REG

FILE 'REGISTRY' ENTERED AT 18:06:05 ON 21 SEP 2007
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=> DISPLAY HISTORY FULL L1-

FILE 'HCAPLUS' ENTERED AT 17:22:10 ON 21 SEP 2007
L1 115 SEA KUERZINGER ?/AU OR KURZINGER ?/AU
L2 549 SEA GRIEBEL ?/AU
L3 4992 SEA GEIGER ?/AU
L4 13373 SEA HERMAN ?/AU OR HERMANN ?/AU
L5 0 SEA L1 AND L2 AND L3 AND L4
L6 1 SEA L1 AND L2 AND L3

FILE 'HCA' ENTERED AT 17:27:20 ON 21 SEP 2007
L7 10718 SEA METAL####(3A)OXIDE#(3A) (PARTICL? OR MICROPARTICL? OR
NANOPARTICL? OR PARTICULAT? OR DUST? OR GRIT? OR GRAIN#
OR GRANUL? OR POWDER? OR FINES# OR PRILL? OR FLAKE# OR
PELLET? OR BB#)
L8 56751 SEA (SOL OR SOLS) (2A) (GEL OR GELS OR GELLED OR GELLING#
OR GELATION? OR GELATIN?)
L9 267 SEA L7 AND L8

FILE 'HCAPLUS' ENTERED AT 17:28:30 ON 21 SEP 2007
SEL L6 1 RN

FILE 'REGISTRY' ENTERED AT 17:28:32 ON 21 SEP 2007
L10 20 SEA (1303-86-2/BI OR 1314-23-4/BI OR 1344-28-1/BI OR
L11 11 SEA L10 AND M/ELS
L12 9 SEA L10 NOT L11
E BORON OXIDE/CN
L13 2 SEA "BORON OXIDE"/CN
L14 183 SEA (B(L)O)/ELS (L) 2/ELC.SUB
E ALUMINA/CN
L15 1 SEA ALUMINA/CN
L16 385 SEA (AL(L)O)/ELS (L) 2/ELC.SUB
E SILICA/CN
L17 1 SEA SILICA/CN
L18 713 SEA (SI(L)O)/ELS (L) 2/ELC.SUB
E ZIRCONIA/CN
L19 1 SEA ZIRCONIA/CN
L20 178 SEA (ZR(L)O)/ELS (L) 2/ELC.SUB
E TITANIA/CN
L21 1 SEA TITANIA/CN
L22 474 SEA (TI(L)O)/ELS (L) 2/ELC.SUB

FILE 'HCA' ENTERED AT 17:40:24 ON 21 SEP 2007

L23 1390692 SEA (L13 OR L14 OR L15 OR L16 OR L17 OR L18 OR L19 OR L20 OR L21 OR L22) OR B2O3 OR AL2O3 OR ALUMINA# OR SIO2 OR SILICA# OR ZRO2 OR ZIRCONIA# OR TIO2 OR TITANIA#

FILE 'REGISTRY' ENTERED AT 17:40:28 ON 21 SEP 2007

L24 509022 SEA (T1 OR T2 OR T3 OR B2)/PG AND (C (L) O (L) X)/ELS
L25 305632 SEA L24 AND CCS/CI
L26 305632 SEA L25 OR L25
L27 155632 SEA RAN=(,150152-50-4) L25 OR L25
L28 150000 SEA RAN=(150152-51-5,) L25 OR L25

FILE 'HCA' ENTERED AT 17:46:09 ON 21 SEP 2007

L29 114661 SEA L27 OR L28

FILE 'REGISTRY' ENTERED AT 17:52:50 ON 21 SEP 2007

L30 673044 SEA M/ELS AND (C (L) O (L) X)/ELS
L31 359110 SEA L30 AND CCS/CI
L32 53478 SEA L31 NOT L26

FILE 'HCA' ENTERED AT 17:58:50 ON 21 SEP 2007

L33 21658 SEA L32
L34 2 SEA L9 AND L33
L35 0 SEA L9 AND L29
L36 192 SEA L9 AND L23
L37 201272 SEA TRANSITION? (2A) METAL####
L38 20 SEA L9 AND L37
L39 16 SEA L38 AND L36
L40 16 SEA L39 NOT L34
L41 185585 SEA RARE# (2A) EARTH# OR LANTHANID? OR LANTHANON? OR LANTHANOID?
L42 6 SEA L9 AND L41
L43 19 SEA (L40 OR L42) NOT L34
L44 11 SEA 1840-2002/PY, PRY AND L43

=> FILE HCA

FILE 'HCA' ENTERED AT 18:06:18 ON 21 SEP 2007

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=> D L34 1-2 CBIB ABS HITSTR HITIND

L34 ANSWER 1 OF 2 HCA COPYRIGHT 2007 ACS on STN

143:18605 Electrically resisting powders for rare earth metal magnets, rare earth metal magnets, methods for their manufacture, rotors for motors, and motors. Satsu, Yuichi; Komuro, Yasuhiro; Watabe, Noriyuki; Tayu, Tetsuro; Ono, Hideaki; Kano, Makoto; Shimada, Munekatsu (Hitachi Ltd., Japan; Nissan Motor Co., Ltd.). Jpn. Kokai Tokkyo Koho JP 2005142374 A 20050602, 18 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2003-377626 20031107.

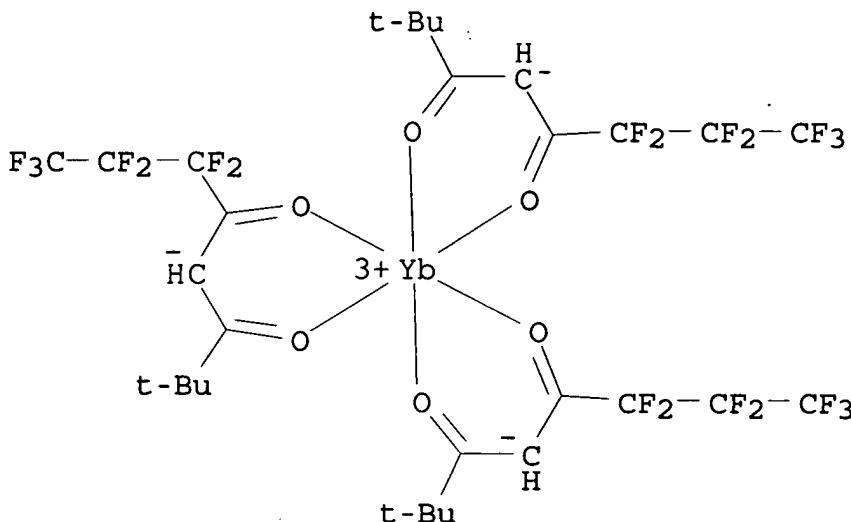
AB Powder for rare earth metal magnets, equipped with coatings contg. ≥ 1 compds. of Tb, Dy, Ho, Er, Tm, Yb, and/or Lu and ≥ 1 metal compds. contg. Al₂O₃, SiO₂, SiC, TiO₂, ZnO, and ZrO₂, are claimed. The powder is manufd. by heat treatment of a mixt. of oxides of the said rare earth metals and an org. soln. of rare earth metal complex of formula RL₃ [R = the said rare earth metal; L = neg. ion ligand of COMeCHCOMe-, COCMe₃CHCOCMe₃-, CO(C₃F₇)CHCOCMe₃-, CO(CF₃)CHCO(CF₃)-, β -diketonato ion, (O-i-C₃H₇)-, (OC₂H₄OMe)-], under deoxidized atm. for formation of rare earth metal oxide coating on rare earth metal magnet particles, followed by application of the said metal compd. coatings. Also claimed is manuf. of the coated particles by heating of a mixt. of the (a) the rare earth **metal oxide-coated powder**, (b) the said **metal oxides**, and (c) a mixt. of an org. solvent contg. ≥ 1 metal alkoxides or metal diketones under deoxidized atm., followed by heat treatment of the powder with a mixt. of Si nitride or polysilazane having extreme low polarity under deoxidized atm.. A similar process carried out in an aq. media or a water-sol. org. solvent is also claimed. The above manufd. coated particles are filled in a mold, pressed under application of magnetic field, and then hot worked to give rare earth metal magnets. Thus manufd. rare earth metal magnets, rotors including the magnets, and motors with the rotors are also claimed.

IT 18323-96-1, Ytterbium tris(6,6,7,7,8,8,8-heptafluoro-2,2-dimethyl-3,5-octanedionate)

(sol-gel coating of elec.-resisting rare earth alloy powder with bilayer coatings including rare earth oxides and their use in prepn. of magnets for rotors in elec. motors)

RN 18323-96-1 HCA

CN Ytterbium, tris(6,6,7,7,8,8,8-heptafluoro-2,2-dimethyl-3,5-octanedionato- κ O, κ O')- (9CI) (CA INDEX NAME)



IC ICM H01F001-09
 ICS B22F001-02; B22F003-02; H01F001-053; H01F001-06; H02K001-27;
 H02K015-03

CC 77-8 (Magnetic Phenomena)
 Section cross-reference(s): 57

ST rare earth metal powder magnet rotor motor; oxide double layer
 coated magnetic powder; **sol gel** coating bilayer
 oxide magnetic powder

IT **Sol-gel** processing
 (coating; **sol-gel** coating of elec.-resisting
 rare earth alloy powder with bilayer coatings including rare
 earth oxides and their use in prepn. of magnets for rotors in
 elec. motors)

IT Rare earth oxides
 (coatings; **sol-gel** coating of elec.-resisting
 rare earth alloy powder with bilayer coatings including rare
 earth oxides and their use in prepn. of magnets for rotors in
 elec. motors)

IT Silazanes
 (di-Me; **sol-gel** coating of elec.-resisting
 rare earth alloy powder with bilayer coatings including rare
 earth oxides and their use in prepn. of magnets for rotors in
 elec. motors)

IT Magnets
 (rare earth metal; **sol-gel** coating of
 elec.-resisting rare earth alloy powder with bilayer coatings
 including rare earth oxides and their use in prepn. of magnets
 for rotors in elec. motors)

IT Electric motors
 (rotors; **sol-gel** coating of elec.-resisting

rare earth alloy powder with bilayer coatings including rare earth oxides and their use in prepn. of magnets for rotors in elec. motors)

IT Silicates, reactions

(sol-gel coating of elec.-resisting rare earth alloy powder with bilayer coatings including rare earth oxides and their use in prepn. of magnets for rotors in elec. motors)

IT Coating process

(sol-gel; sol-gel coating of elec.-resisting rare earth alloy powder with bilayer coatings including rare earth oxides and their use in prepn. of magnets for rotors in elec. motors)

IT 1308-87-8P, Dysprosium oxide 1314-37-0P, Ytterbium oxide

12036-44-1P, Thulium oxide 12055-62-8P, Holmium oxide

12061-16-4P, Erbium oxide

(coating; sol-gel coating of elec.-resisting rare earth alloy powder with bilayer coatings including rare earth oxides and their use in prepn. of magnets for rotors in elec. motors)

IT 1314-13-2, Zinc oxide, processes 1314-23-4, Zirconia, processes

1344-28-1, Alumina, processes 7631-86-9, Silica, processes

12033-89-5, Silicon nitride, processes 13463-67-7, Titania, processes

(coating; sol-gel coating of elec.-resisting rare earth alloy powder with bilayer coatings including rare earth oxides and their use in prepn. of magnets for rotors in elec. motors)

IT 94282-59-4 639086-68-3 852620-73-6 852620-75-8

(magnetic particles; sol-gel coating of elec.-resisting rare earth alloy powder with bilayer coatings including rare earth oxides and their use in prepn. of magnets for rotors in elec. motors)

IT 11099-06-2, Tetraethoxysilane homopolymer 12002-26-5;

Tetramethoxysilane homopolymer

(oligomeric; sol-gel coating of elec.-resisting rare earth alloy powder with bilayer coatings including rare earth oxides and their use in prepn. of magnets for rotors in elec. motors)

IT 1071-76-7 13963-57-0, Aluminum tris(2,4-pentanedionate)

14024-63-6, Zinc acetylacetone 14637-88-8, Dysprosium

tris(2,4-pentanedionate) 14814-07-4, Tris(isopropoxy)erbium

15522-73-3, Holmium tris(2,2,6,6-tetramethyl-3,5-heptanedionate)

15631-58-0 17927-72-9, Titanium disopropoxide bis(2,4-

pentanedionate) 18323-96-1, Ytterbium tris(6,6,7,7,8,8,8-

heptafluoro-2,2-dimethyl-3,5-octanedionate) 32169-90-7,

Poly[imino(dimethylsilylene)]

(sol-gel coating of elec.-resisting rare

earth alloy powder with bilayer coatings including rare earth oxides and their use in prepn. of magnets for rotors in elec. motors)

IT 64-17-5, Ethyl alcohol, uses 67-56-1, Methyl alcohol, uses 67-63-0, Isopropyl alcohol, uses 71-36-3, n-Butyl alcohol, uses 108-88-3, Toluene, uses (solvent; **sol-gel** coating of elec.-resisting rare earth alloy powder with bilayer coatings including rare earth oxides and their use in prepn. of magnets for rotors in elec. motors)

L34 ANSWER 2 OF 2 HCA COPYRIGHT 2007 ACS on STN

139:247586 Modified **metal oxide nanoparticle**

suspensions with hydrophobic inclusions. Geiger, Albert; Griebel, Dragan; Herrmann, Rupert; Kuerzinger, Konrad (Roche Diagnostics G.m.b.H., Germany; Fraunhofer-Gesellschaft zur Foerderung der Angewandten Forschung e.V.; F. Hoffmann-La Roche A.-G.). PCT Int. Appl. WO 2003074420 A1 20030912, 43 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (German). CODEN: PIXXD2. APPLICATION: WO 2003-EP2198 20030304. PRIORITY: DE 2002-10209744 20020306.

AB Modified **metal oxide nanoparticles** are prepd. by the **sol-gel** process contg. hydrophobic inclusions and can include dye-type mols. as well as halogen-contg. lanthanide coordination compds. The **sol-gel** process includes controlled hydrolysis of metal oxide or metal halide precursors, esp. tetraethoxysilane and tetramethoxysilane, in the presence of a fluoro-org. alkoxy silane or an arylalkoxy silane, which incorporates hydrophobic or oleophobic target mols. into the nanoparticles. These manufd. nanoparticles have use esp. as toners, sunscreen products, insecticides, and for marking of biomols.

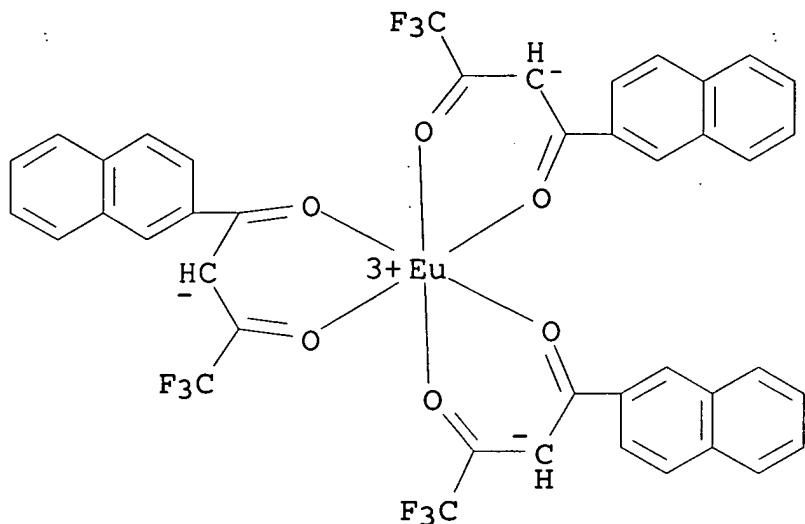
IT 80233-27-8P 291301-67-2P 600152-95-2P

600152-96-3P 600152-97-4P

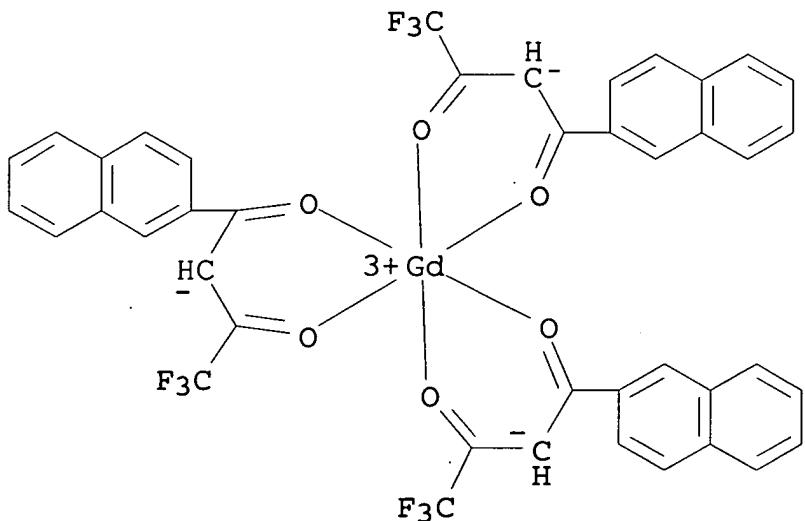
(incorporation of; modified **metal oxide nanoparticle** suspensions with hydrophobic inclusions)

RN 80233-27-8 HCA

CN Europium, tris[4,4,4-trifluoro-1-(2-naphthalenyl)-1,3-butanedionato- κ O, κ O']- (9CI) (CA INDEX NAME)

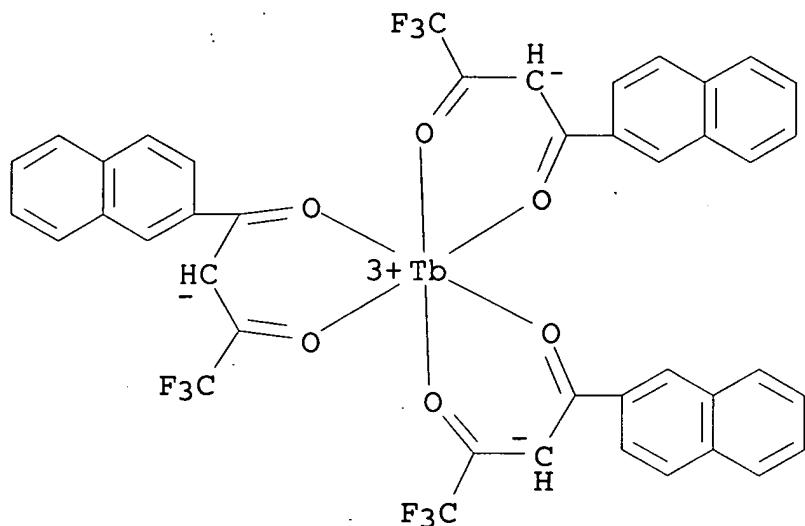


RN 291301-67-2 HCA

CN Gadolinium, tris[4,4,4-trifluoro-1-(2-naphthalenyl)-1,3-butanedionato- $\kappa\text{O},\kappa\text{O}'$]- (9CI) (CA INDEX NAME)

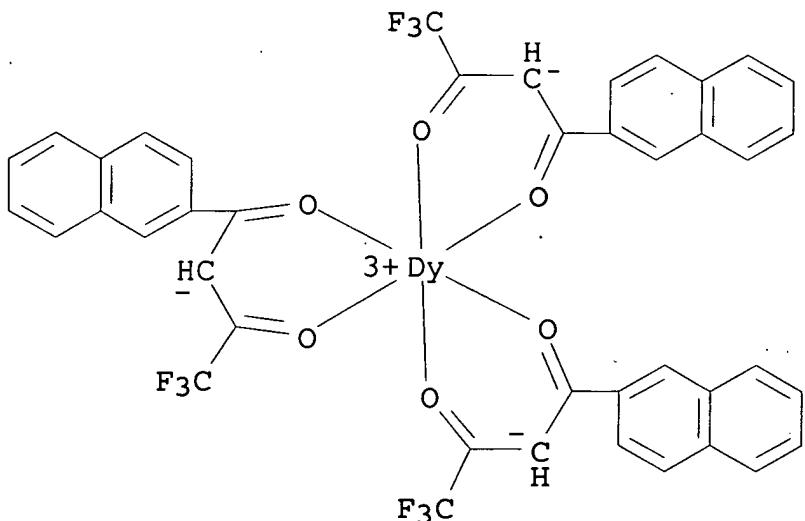
RN 600152-95-2 HCA

CN Terbium, tris[4,4,4-trifluoro-1-(2-naphthalenyl)-1,3-butanedionato- $\kappa\text{O},\kappa\text{O}'$]- (9CI) (CA INDEX NAME)



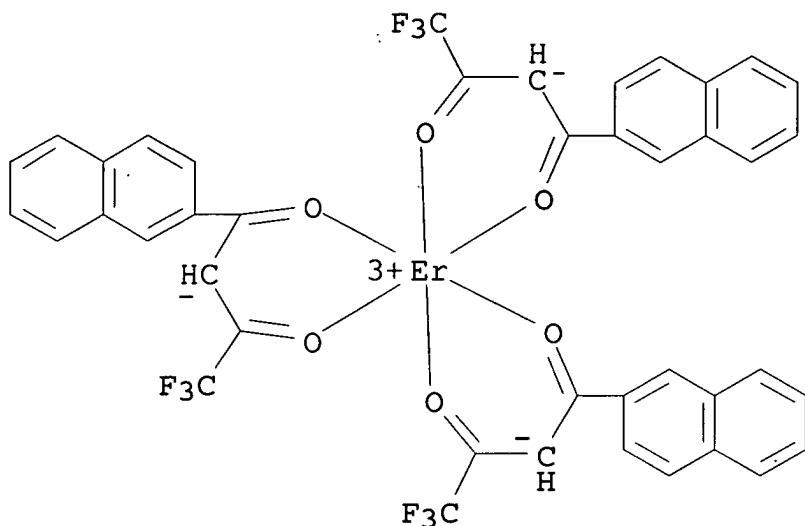
RN 600152-96-3 HCA

CN Dysprosium, tris[4,4,4-trifluoro-1-(2-naphthalenyl)-1,3-butanedionato- κ O, κ O']- (9CI) (CA INDEX NAME)



RN 600152-97-4 HCA

CN Erbium, tris[4,4,4-trifluoro-1-(2-naphthalenyl)-1,3-butanedionato- κ O, κ O']- (9CI) (CA INDEX NAME)



IC ICM C01B033-14
 ICS C09C001-28; C09C003-00; C01B013-32; C01B033-113

CC 49-7 (Industrial Inorganic Chemicals)
 Section cross-reference(s): 9, 15, 63

ST biomol marker modified oxidic nanoparticle; lanthanide complex dye
 oleophobic nanoparticle; insecticide marker modified oxidic
 nanoparticle; antibody marker modified oxidic nanoparticle;
sol gel hydrophobic silica nanoparticle
 fluoroalkyl silane

IT Ketones, preparation
 (1,3-diketones, fluoro, rare earth metal complexes, incorporation
 of; modified **metal oxide nanoparticle**
 suspensions with hydrophobic inclusions)

IT Antibodies and Immunoglobulins
 (antidigoxigenin, markers for; modified **metal**
oxide nanoparticle suspensions with hydrophobic
 inclusions)

IT Rare earth complexes
 (fluoro 1,3-diketone, incorporation of; modified **metal**
oxide nanoparticle suspensions with hydrophobic
 inclusions)

IT Electrophotographic toners
 Insecticides
 (markers for; modified **metal oxide**
nanoparticle suspensions with hydrophobic inclusions)

IT Biochemical compounds
 (markers for; modified **metal oxide**
nanoparticle suspensions with hydrophobic inclusions)

IT Sol-gel processing
 (modified **metal oxide nanoparticle**)

suspensions with hydrophobic inclusions)

IT Test kits
(strips, for immunol. testing; modified **metal oxide nanoparticle** suspensions with hydrophobic inclusions)

IT 93642-68-3
(hydrophilic silica source; modified **metal oxide nanoparticle** suspensions with hydrophobic inclusions)

IT 429-60-7, 3,3,3-Trifluoropropyltrimethoxysilane
(hydrophobic silica source; modified **metal oxide nanoparticle** suspensions with hydrophobic inclusions)

IT 893-33-4DP, lanthanide metal complexes 80233-27-8P
245670-26-2P, LightCyclerRed 640 291301-67-2P
600152-95-2P 600152-96-3P 600152-97-4P
600152-98-5P 600152-99-6P 600153-00-2P
(incorporation of; modified **metal oxide nanoparticle** suspensions with hydrophobic inclusions)

IT 1672-46-4, Digoxigenin
(markers for antibodies against; modified **metal oxide nanoparticle** suspensions with hydrophobic inclusions)

IT 1303-86-2, Boron oxide (B2O3), uses
(**nanoparticles**; modified **metal oxide nanoparticle** suspensions with hydrophobic inclusions)

IT 1314-23-4, Zirconia, uses 1344-28-1, Alumina, uses 7631-86-9,
Silica, uses 13463-67-7, Titania, uses
(**nanoparticles**; modified **metal oxide nanoparticle** suspensions with hydrophobic inclusions)

IT 78-10-4, Tetraethoxysilane 681-84-5, Tetramethoxysilane
(silica source; modified **metal oxide nanoparticle** suspensions with hydrophobic inclusions)

=> D L44 1-11 CBIB ABS HITSTR HITIND

L44 ANSWER 1 OF 11 HCA COPYRIGHT 2007 ACS on STN

145:171895 Method for manufacturing ultrafine spherical ni particle.

Jung, Gyeong Yeol; Kang, Yun Chan; Park, Hui Dong; Son, Jong Rak
(Korea Research Institute of Chemical Technology, S. Korea). Repub.
Korean Kongkae Taeho Kongbo KR 2004047154 A 20040605, No pp. given
(Korean). CODEN: KRXXA7. APPLICATION: KR 2002-75262 20021129.

AB A method for manufg. spherical Ni **metal** or nickel
oxide fine **particle** having non-porous densified
internal structure by adding colloid soln. also during prepn. of
precursor spray soln. in prepn. method of Ni metal fine particle

using spray pyrolysis is provided. The method comprises the processes of prep. a Ni precursor soln. by dissolving a nickel compd. selected from nickel nitrate, nickel acetate, nickel chloride, nickel hydrate, and nickel sulfate into nano metal colloid soln.; generating droplets having diam. of 0.1 to 100 μm by injecting the precursor soln. into a droplet sprayer; and drying and pyrolyzing the generated droplets in the reactor temp. range of 500 to 1,500°C, wherein the size of metal particles in the nano metal colloid soln. is 10 to 500 nm, wherein the nano metal colloid soln. is prep'd. by dispersing a metal nano particle selected from nano **silica**, nano **titania**, nano silver, nano **yttria**, nano nickel and hydrate particle thereof into a water sol. or org. solvent, wherein the nano metal colloid soln. is prep'd. by **sol-gel** reacting the mixt. after prep. a mixt. by mixing a metal compd. selected from nitrate, acetate, chloride, hydrate and sulfate of a metal selected from **metals**, **transition metals** and **lanthanide metals** of group I to group IV in the periodic table with urea in a mole ratio of 1:1 to 1:1,000, and wherein the nano metal colloid soln. is prep'd. by **sol-gel** reacting the soln. after dissolving and dispersing a metal alkoxide selected from titanium isopropoxide, tetraethoxy orthosilicate (TEOS) and a mixt. thereof into a solvent.

IT 7631-86-9, **Silica**, processes 13463-67-7,
Titania, processes

(colloid component; manufg. ultrafine spherical Ni or Ni oxide particles by spray pyrolysis of colloid soln.)

RN 7631-86-9 HCA

CN Silica (CA INDEX NAME)

O=Si=O

RN 13463-67-7 HCA
CN Titanium oxide (TiO₂) (CA INDEX NAME)

O=Ti=O

IC ICM B22F009-08
CC 56-4 (Nonferrous Metals and Alloys)
Section cross-reference(s): 57

IT Colloids
Nanoparticles

Sol-gel processing

(manufg. ultrafine spherical Ni or Ni oxide particles by spray pyrolysis of colloid soln.)

IT 57-13-6, Urea, processes 1314-36-9, **Yttria**, processes 7440-22-4,

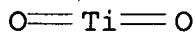
Silver, processes 7631-86-9, Silica, processes
13463-67-7, Titania, processes
 (colloid component; manufg. ultrafine spherical Ni or Ni oxide
 particles by spray pyrolysis of colloid soln.)

L44 ANSWER 2 OF 11 HCA COPYRIGHT 2007 ACS on STN
 136:91382 Ultrathin composite films: An indispensable resource for nanotechnology. Ichinose, Izumi; He, Junhui; Fujikawa, Shigenori; Hashizume, Mineo; Huang, Jianguo; Kunitake, Toyoki (Topochemical Design Laboratory, Frontier Research System, RIKEN, Japan). RIKEN Review, 37, 34-37 (English) 2001. CODEN: RIREE6. ISSN: 0919-3405. Publisher: Institute of Physical and Chemical Research.

AB Ultrathin nanocomposite films were prepd. on solid supports via adsorption of org. and inorg. mols. from soln. Coordination geometry for **transition metal** ions was preserved by embedding metal ligands into titanium oxide gel films, and porous titanium oxide films were prepd. by selective removal of org. components from polymer/metal oxide composite films using oxygen plasma processing. **Nanoparticles** coated with thin **metal oxide** films were employed to form hollow shell structures, and wrapping of mols. with thin metal oxide layers was successfully achieved by controlled reaction in soln. These new methodologies based on ultrathin composite films should be useful as fundamental tools for the prepn. of nano-structured materials.

IT **13463-67-7P, Titania, properties**
 (deposition and plasma treatment of **titania/polymer** composite ultrathin films imprinted by **transition metal** ions)

RN 13463-67-7 HCA
 CN Titanium oxide (TiO₂) (CA INDEX NAME)



CC 66-4 (Surface Chemistry and Colloids)
 ST **titania** film deposition **sol gel**
 process oxygen plasma treatment; polymer **titania** composite film **sol gel** process

IT Adsorption
 Composites
 Microstructure
 Plasma
 Porous materials
Sol-gel processing
 Transmission electron microscopy
 (deposition and plasma treatment of **titania/polymer** composite ultrathin films imprinted by **transition metal** ions)

IT 9002-98-6P 9011-14-7P, Poly(methyl methacrylate)
13463-67-7P, Titania, properties
 (deposition and plasma treatment of **titania/polymer**
 composite ultrathin films imprinted by **transition**
metal ions)

IT 15158-11-9, Copper(2+), reactions 23713-49-7, Zinc(2+), reactions
 (deposition and plasma treatment of **titania/polymer**
 composite ultrathin films imprinted by **transition**
metal ions)

L44 ANSWER 3 OF 11 HCA COPYRIGHT 2007 ACS on STN
 135:214698 Synthesis of ceramic powders by using lamellar **silica**
 as precursor. de Farias, R. F. (Departamento de Quimica,
 Universidade Federal de Roraima, UFRR, Boa Vista Roraima, 69301-970,
 Brazil). Journal of Non-Crystalline Solids, 288(1-3), 218-220
 (English) 2001. CODEN: JNCSBJ. ISSN: 0022-3093.

Publisher: Elsevier Science B.V..

AB In this work, it is shown that, by using lamellar **silica**
 samples and metal chlorides as precursors, homogeneous ceramic
 powders of the type **SiO₂-MO**, with M=Zn, Mn, Ni and Co, can
 be synthesized. The powders were obtained by dispersion of 2.0 g of
 lamellar **silica** powders in 200 cm³ of a 0.5 mol.dm⁻³ soln.
 of the resp. metal chloride, followed by filtration and calcination
 at 600°C for 30 min in an oxidizing atm. As verified by the
 mapping of the elements, performed by SEM and EDX anal., the powders
 are chloride free, whereas silicon and M are homogeneously
 distributed. The M/Si ratio for the calcined samples are 0.93,
 1.14, 1.64 and 1.62 for M=Zn, Mn, Ni and Co, resp. The BET surface
 areas for the same previous sequence of powders are 33 ±3, 26
 ±1.4, 20 ±0.2 and 43 ±0.2 m².g⁻¹, resp.

IT 7631-86-9, **Silica, processes**
 (composite powders; **sol-gel** synthesis of
 homogeneous ceramic composite powders using lamellar
silica and metal chlorides as precursors)

RN 7631-86-9 HCA

CN Silica (CA INDEX NAME)

O—Si—O

CC 57-2 (Ceramics)
 Section cross-reference(s): 49
 ST **silica transition metal oxide**
 composite powder prep lamellar **silica**; zinc
 oxide **silica** composite powder prep lamellar
silica precursor; manganese oxide **silica** composite
 powder prep lamellar **silica** precursor; nickel oxide
silica composite powder prep lamellar **silica**

precursor; cobalt oxide **silica** composite powder prepn
lamellar **silica** precursor

IT Powders

(ceramic, **silica-transition metal**
oxide composite; **sol-gel** synthesis of
homogeneous ceramic composite powders using lamellar
silica and metal chlorides as precursors)

IT Ceramics

(**powders, silica-transition**
metal oxide composite; **sol-**
gel synthesis of homogeneous ceramic composite powders
using lamellar **silica** and metal chlorides as
precursors)

IT Ceramic composites

(**silica-transition metal**
oxide powders; **sol-gel**
synthesis of homogeneous ceramic composite powders using lamellar
silica and metal chlorides as precursors)

IT Calcination

Sol-gel processing

Surface area

(**sol-gel** synthesis of homogeneous ceramic
composite powders using lamellar **silica** and metal
chlorides as precursors)

IT 7631-86-9, Silica, processes

(composite powders; **sol-gel** synthesis of
homogeneous ceramic composite powders using lamellar
silica and metal chlorides as precursors)

IT 1307-96-6P, Cobalt oxide coo, preparation 1313-99-1P, Nickel oxide
(NiO), preparation 1314-13-2P, Zinc oxide (ZnO), preparation
1344-43-0P, Manganese oxide (MnO); preparation
(composite powders; **sol-gel** synthesis of
homogeneous ceramic composite powders using lamellar
silica and metal chlorides as precursors)

IT 78-10-4, Teos 7646-79-9, Cobalt Chloride, processes 7646-85-7,
Zinc Chloride, processes 7718-54-9, Nickel Chloride, processes
11132-78-8, Manganese Chloride
(precursor; **sol-gel** synthesis of homogeneous
ceramic composite powders using lamellar **silica** and
metal chlorides as precursors)

IT 2783-17-7, 1,12-Diaminododecane

(sequestering agent; **sol-gel** synthesis of
homogeneous ceramic composite powders using lamellar
silica and metal chlorides as precursors)

oxides. Wu, Nae-Lih (Department of Chemical Engineering, National Taiwan University, Taipei, 106, Taiwan). Advances in Science and Technology (Faenza, Italy), 29(Mass and Charge Transport in Inorganic Materials, Part B), 839-846 (English) 2000.

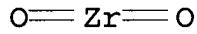
CODEN: ASETE5. Publisher: Techna.

AB Crystallite growth upon calcination of hydrous **transition metal** oxide gels can be effectively inhibited by replacing the surface hydroxyl group prior to calcination with Me siloxyl, which does not condense and can produce small secondary-phase particles which restrict advancing of grain boundaries at elevated temps. This pretreatment allows the gel, upon calcination, to crystallize, while suppressing growth of existing crystals. As a result, the gel is uniformly crystd. to give nanocrystallites with a size less than 10 nm. Examples of SnO₂ and ZrO₂ are given. For the latter, the pretreatment also enhances the metastability of tetragonal crystallites.

IT 1314-23-4P, Zirconium oxide (ZrO₂), preparation (ceramics; inhibited grain growth in **sol-gel** synthesis of nanocryst. **transition metal oxides**)

RN 1314-23-4 HCA

CN Zirconium oxide (ZrO₂) (CA INDEX NAME)



CC 57-2 (Ceramics)

ST **metal oxide sol gel**
synthesis grain growth nanocryst

IT **Transition metal oxides**
(ceramics; inhibited grain growth in **sol-gel** synthesis of nanocryst. **transition metal oxides**)

IT Calcination

Crystal growth

Crystallization

Dehydroxylation

Heat treatment

Microstructure

Sol-gel processing
(inhibited grain growth in **sol-gel** synthesis of nanocryst. **transition metal oxides**)

IT Stability
(metastability, of tetragonal crystallites; inhibited grain growth in **sol-gel** synthesis of nanocryst. **transition metal oxides**)

IT Ceramics
(nanocryst.; inhibited grain growth in **sol-gel**

synthesis of nanocryst. transition metal oxides)

IT 1314-23-4P, Zirconium oxide (ZrO_2), preparation
 18282-10-5P, Tin oxide (SnO_2)
 (ceramics; inhibited grain growth in sol-gel synthesis of nanocryst. transition metal oxides)

IT 1314-36-9, Yttria, uses
 (inhibited grain growth in sol-gel synthesis of nanocryst. transition metal oxides)

L44 ANSWER 5 OF 11 HCA COPYRIGHT 2007 ACS on STN

135:40053 New oxygen sensitive films for oxygen sensor. Xu, Mingxia; Zheng, Liaoying; Liu, Liyue; Fan, Liying; Xu, Tingxian (School of Materials Science and Engineering, Tianjin University, Tianjin, 300072, Peop. Rep. China). Cailiao Yanjiu Xuebao, 15(1), 17-22 (Chinese) 2001. CODEN: CYXUEV. ISSN: 1005-3093.

Publisher: Cailiao Yanjiu Xuebao Bianjibu.

AB Three types oxygen nanometer particle film materials, including transitional metal oxide (MoO_2 , TiO_x and CrO_x etc.), perovskite-type ($SrTiO_3$ / $LaNiO_3$, $LaNiO_3$ and $LaCrO_3$ etc.) and perovskite-like type ($La_{1-x}M_xNiO_4$), were prepd. by sol-gel. The expt. results showed that comparing with the traditional ZrO_2 , TiO_2 semiconductor materials for oxygen sensor, these three types materials have low coeffs. of resistance-temp., high sensitivity to the change of circumstance oxygen and rapid response.

IT 12065-65-5, Titanium oxide (Ti_3O_5) 13463-67-7,
 Titanium oxide (TiO_2), uses
 (evaluation of nanometer particle film materials for oxygen sensors)

RN 12065-65-5 HCA

CN Titanium oxide (Ti_3O_5) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	5	17778-80-2
Ti	3	7440-32-6

RN 13463-67-7 HCA

CN Titanium oxide (TiO_2) (CA INDEX NAME)

O—Ti—O

CC 79-2 (Inorganic Analytical Chemistry)

IT Transition metal oxides

(evaluation of nanometer **particle** film materials for oxygen sensors)

IT 11118-57-3, Chromium oxide 12017-94-6, Chromium lanthanum oxide (CrLaO₃) 12031-18-4, Lanthanum nickel oxide (LaNiO₃) 12031-41-3, Lanthanum nickel oxide (La₂NiO₄) 12060-59-2, Strontium titanate (SrTiO₃) 12065-65-5, Titanium oxide (TiO₂)
13463-67-7, Titanium oxide (TiO₂), uses 18868-43-4, Molybdenum oxide (MoO₂)
 (evaluation of nanometer particle film materials for oxygen sensors)

L44 ANSWER 6 OF 11 HCA COPYRIGHT 2007 ACS on STN

135:23457 Manufacture of ceramic parts for microsystems by **sol-gel** method. Penth, Bernd (Germany). Ger. Offen. DE 19957723 A1 20010613, 2 pp. (German). CODEN: GWXXBX.
 APPLICATION: DE 1999-19957723 19991130.

AB The green compacts of ceramic articles with a size of ≤ 1 mm are manufd. by prep. a dispersion of **metal oxide powder** having a **particle** size of ≤ 5 μm in an inorg. sol (esp. **silica** sol), filling the mold, drying, and firing. The inorg. sol is made by (a) dissolving a metal chloride or nitrate in water, (b) dissolving a metal salt in HCl or HNO₃, or (c) hydrolysis of org. metal compd. (e.g., titanium alcoholate) with HCl or HNO₃. Metal oxides are selected from TiO₂, alumina, and zircon.

IT **1344-28-1**, **Alumina**, processes **13463-67-7**, Titanium oxide (TiO₂), processes (sol dispersion of; manuf. of ceramic parts for microsystems by **sol-gel** method)

RN 1344-28-1 HCA

CN Aluminum oxide (Al₂O₃) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

RN 13463-67-7 HCA

CN Titanium oxide (TiO₂) (CA INDEX NAME)

O—Ti—O

IC ICM C04B035-00

ICS C04B035-01

CC 57-2 (Ceramics)

ST ceramic **silica** **sol** **gel** metal oxide

IT **Transition metal chlorides**

(aq. solns.; manuf. of ceramic parts for microsystems by **sol-gel** method)

IT **Powders**

(ceramic, **metal oxide**; manuf. of ceramic parts for microsystems by **sol-gel** method)

IT Silica gel, processes
(dispersion of; manuf. of ceramic parts for microsystems by sol-gel method)

IT Sol-gel processing
(green compacts of ceramic; manuf. of ceramic parts for microsystems by sol-gel method)

IT Ceramics
(green compacts of; manuf. of ceramic parts for microsystems by sol-gel method)

IT Nitrates, processes
(metal nitrates, aq. solns.; manuf. of ceramic parts for microsystems by sol-gel method)

IT Dispersion (of materials)
(metal oxide slip; manuf. of ceramic parts for microsystems by sol-gel method)

IT Ceramics
(powders, metal oxide; manuf. of ceramic parts for microsystems by sol-gel method)

IT Metal alkoxides
(titanium, hydrolysis in acids; manuf. of ceramic parts for microsystems by sol-gel method)

IT 1344-28-1, Alumina, processes 13463-67-7
, Titanium oxide (TiO₂), processes 14940-68-2, Zircon
(sol dispersion of; manuf. of ceramic parts for microsystems by sol-gel method)

L44 ANSWER 7 OF 11 HCA COPYRIGHT 2007 ACS on STN

134:125072 Metal oxides. Phase transformation from solid precursors.

Sugimoto, Tadao (Institute for Advanced Materials Processing, Tohoku University, Sendai, Japan). Surfactant Science Series, 92(Fine Particles), 58-83 (English) 2000. CODEN: SFSSA5. ISSN: 0081-9603. Publisher: Marcel Dekker, Inc..

AB A review with 37 refs. The prepn. of monodisperse particles of various metal oxides via a sol gel route is described. It is distinguished between the pptn. from a dild. soln. and the prepn. from a condensed system. Among the systems treated are: Co₃O₄, Fe₃O₄, Fe₂O₃, ferrites, TiO₂, ZrO₂, CuO, and Cu₂O. The growth mechanisms and resulting microstructures of the oxide particles are discussed.

CC 78-0 (Inorganic Chemicals and Reactions)
Section cross-reference(s): 75

ST review transition metal oxide
nanoparticle sol gel prepn

microstructure

IT Microstructure
(of transition metal oxides prepd. via sol-gel route with phase transformation from

solid precursors)
IT Sol-gel processing
(prepn. of transition metal oxides via
sol-gel route with phase transformation from
solid precursors)
IT Transition metal oxides
(prepn. of transition metal oxides via
sol-gel route with phase transformation from
solid precursors)

L44 ANSWER 8 OF 11 HCA COPYRIGHT 2007 ACS on STN
129:139481 Optical fibers by a hybrid process using sol-
gel silica overcladding tubes. MacChesney, J. B.;
Johnson, D. W., Jr.; Bhandarkar, S.; Bohrer, M. P.; Fleming, J. W.;
Monberg, E. M.; Trevor, D. J. (Bell Laboratories, Lucent
Technologies, Murray Hill, NJ, 07974, USA). Journal of
Non-Crystalline Solids, 226(3), 232-238 (English) 1998.
CODEN: JNCSBJ. ISSN: 0022-3093. Publisher: Elsevier Science B.V..
AB We have successfully developed a sol-gel process
to produce large silica glass bodies to be used as optical
fiber preform overcladding tubes which meet the demands of optical
fiber. We have made and tested tubes weighing approx. 4.5 kg, which
comprise about 90% of the eventual fiber's mass. This sol
-gel process uses colloidal silica dispersed in
high pH water. The sol is cast, gelled by
reducing the pH and dried to a porous tube. The dried body is heat
treated to remove orgs., to dehydrate and to purify by removing both
refractory oxide particles and
transition metal ions to the parts/billion range
and then sintered to transparency in He. These tubes are
competitive with vapor deposited synthetic silica tubes
and produce fiber meeting current com. stds. Net shape formation of
large precision glass bodies by gel casting is demonstrated.

IT 60676-86-0P, Vitreous silica
(optical fiber preform overcladding tubes; optical fibers by a
hybrid process using sol-gel silica
overcladding tube preforms)

RN 60676-86-0 HCA

CN Silica, vitreous (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CC 57-1 (Ceramics)

Section cross-reference(s): 73

ST glass silica sol gel overcladding
tube; optical fiber sol gel silica
preform

IT Molding of ceramics

(casting, gel-casting; optical fibers by a hybrid process using
sol-gel silica overcladding tube

IT preforms)

IT Heat treatment
(dehydration/purifn. by; optical fibers by a hybrid process using
sol-gel silica overcladding tube
preforms)

IT Dehydration
Purification
(of preform; optical fibers by a hybrid process using **sol**
-gel silica overcladding tube preforms)

IT Sintering
(of **silica** preform; optical fibers by a hybrid process
using **sol-gel silica** overcladding
tube preforms)

IT Optical fibers
Sol-gel processing
(optical fibers by a hybrid process using **sol-**
gel silica overcladding tube preforms)

IT Pipes and Tubes
(**silica** overcladding; optical fibers by a hybrid
process using **sol-gel silica**
overcladding tube preforms)

IT 60676-86-0P, Vitreous **silica**
(optical fiber preform overcladding tubes; optical fibers by a
hybrid process using **sol-gel silica**
overcladding tube preforms)

L44 ANSWER 9 OF 11 HCA COPYRIGHT 2007 ACS on STN

125:71389 Manufacture of silica glass optical waveguide. Konishi,
Shigeru; Kamya, Kazuo (Shinetsu Chemical Industry Co., Ltd., Japan).
Jpn. Kokai Tokkyo Koho JP 08091856 A 19960409 Heisei, 5
pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1994-226506
19940921.

AB The manuf., for an optical waveguide contg. a lower cladding layer
(A), a core layer (B) of a higher-refractive index than that of A,
and a upper cladding layer (C) of a lower-refractive index than that
of B, comprises these steps: forming a porous-glass layer by coating
a sol soln., prep'd. by mixing a Si alkoxide-hydrolyzed sol obtained
by adding another metal alkoxide(s), with a dispersed soln. of a
micro-powdery metal oxide, on a
substrate, transparent-vitrifying it by heating to form a silica
glass-thin film layer, and repeating these steps. The Si alkoxide
may be a mixt. with Ti-, Ge-, Al-, or a **rare earth**
-alkoxide. The **metal oxide micro-powder**
may be silica, titania, germania, alumina, Er2O3, Nd2O3, and/or
Dy2O3. The manuf. provides a crack-less silica-type optical
waveguide glass in an improved through put.

IC ICM C03B019-12
ICS C03B020-00; G02B006-13

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
 Section cross-reference(s) : 57

ST silica glass optical waveguide refractive index; **sol**
gel coating optical waveguide

IT Waveguides
 (optical, Manuf. of silica-glass optical waveguide by **sol**-
gel method)

IT Coating process
 (**sol-gel**, Manuf. of silica-glass optical waveguide by **sol-gel** method)

IT 52337-09-4P, Silicon titanium oxide
 (core layer; Manuf. of silica-glass optical waveguide by
sol-gel method)

IT 7429-90-5D, Aluminum, alkoxide 7440-56-4D, Germanium, alkoxide
 (sol component; Manuf. of silica-glass optical waveguide by
sol-gel method)

IT 7631-86-9P, Aerosil 130, properties
 (sol soln.; Manuf. of silica-glass optical waveguide by
sol-gel method)

IT 78-10-4, Silicon tetraethoxide 546-68-9, Titanium
 tetraisopropoxide 1308-87-8, Dysprosium oxide 1308-96-9,
 Europium oxide 1310-53-8, Germania, uses 1313-97-9, Neodymium
 oxide 1344-28-1, Alumina, uses
 (sol soln.; Manuf. of silica-glass optical waveguide by
sol-gel method)

IT 13463-67-7, P 25, uses
 (sol soln.; Manuf. of silica-glass optical waveguide by
sol-gel method)

L44 ANSWER 10 OF 11 HCA COPYRIGHT 2007 ACS on STN

107:80484 Monolithic gel and powder of transition
 metal oxides, and thin films of these oxides.

Henry, Marc; Vioux, Andre; Livage, Jacques (Centre National de la
 Recherche Scientifique, Fr.). Fr. Demande FR 2585973 A1
 19870213, 17 pp. (French). CODEN: FRXXBL. APPLICATION: FR
 1985-12019 19850806.

AB The title materials are prep'd. by carboxylic acid-catalyzed
 hydrolysis of an alc. soln. of a compd. of the formula MX_n [M =
 e.g., Ti, Zr, Nb, or Ta; X = R₁O or R₁C(O)CR₂ = CR₃O; R_{1,3} = alkyl;
 R₂ = H or alkyl]. The resulting oxide gel may contain a doping
 element, e.g., Al or Cr in the case of Ti. The gel may be dried to
 yield fine oxide powder, or may be applied to a substrate to give
 oxide thin films. (BuO)₄Ti 3.6 was mixed with ACOH 1 and BuOH-10%
 H₂O 10 mL was added; after 2 min at room temp., a transparent,
 monolithic gel with good mech. properties had formed. The gel was
 dried at 60° to give a clear TiO₂ powder of diam.
 .apprx.75 nm.

IT 1314-23-4P, Zirconia, preparation
 13463-67-7P, Titania, preparation
 (sol-gel prepn. of, as powder or films)
 RN 1314-23-4 HCA
 CN Zirconium oxide (ZrO₂) (CA INDEX NAME)

O—Zr—O

RN 13463-67-7 HCA
 CN Titanium oxide (TiO₂) (CA INDEX NAME)

O—Ti—O

IC ICM B01J013-00
 ICS C01G023-04; C01G025-02; C01G033-00; C01G035-00
 CC 49-3 (Industrial Inorganic Chemicals)
 Section cross-reference(s): 57, 76
 ST transition metal oxide powder
 film; sol gel titania powder
 IT Films
 (oxide, sol-gel prepn. of)
 IT Ceramic materials and wares
 (powd., sol-gel prepn. of)
 IT 64-19-7, Acetic acid, uses and miscellaneous
 (catalyst, in sol-gel prepn. of oxide powders
 and films)
 IT 3085-30-1, Aluminum tributoxide 3236-82-6, Niobium pentaethoxide
 5593-70-4, Titanium tetrabutoxide 21679-31-2, Chromium
 triacetylacetone 23519-77-9, Zirconium tetrapropoxide
 (hydrolysis of, in sol-gel prepn. of oxide
 powders and films)
 IT 1313-96-8P 1314-23-4P, Zirconia, preparation
 1314-61-0P 13463-67-7P, Titania, preparation
 (sol-gel prepn. of, as powder or films)
 IT 71-36-3, Butanol, uses and miscellaneous
 (solvent, in sol-gel prepn. of oxide powders
 and films)
 IT 7429-90-5P, Aluminum, uses and miscellaneous 7440-47-3P, Chromium,
 uses and miscellaneous
 (titania doped with, sol-gel prepn.
 of)

L44 ANSWER 11 OF 11 HCA COPYRIGHT 2007 ACS on STN
 64:57390 Original Reference No. 64:10708b-d Preparation, coating,
 evaluation, and irradiation testing of solgel oxide microspheres.
 Wymer, R. G.; Coobs, J. H. (Oak Ridge Natl. Lab., Oak Ridge, TN).

U.S. At. Energy Comm., ORNL-P-1725, 17 pp. (English) 1965.

AB Microspheres of ThO₂, PuO₂, ThO₂-UO₂, ThO₂-PuO₂, **rare earth oxides**, and Am and Cm oxides were prep'd. at ORNL by **sol-gel** techniques. ThO₂, ThO₂-UO₂, and UO₂ microspheres were coated with pyrolytic C in fluidized beds. Sphere forming was accomplished by dispersing sols in 2-ethyl-1-hexanol contg. appropriate surfactants. The engineering feasibility of microsphere forming was demonstrated by using a variety of sol-dispersing techniques. **Sol-gel** micro-spheres, because of their sphericity and uniform size, are well suited to coating in fluidized beds. The thermal and chemical stabilities of pyrolytic-C-coated ThO₂, ThO₂-UO₂, and UO₂ microspheres were demonstrated by their ability to withstand severe heat treatments (100 hrs. at 1900° in vacuum, or 15 min. at 2600°) without failure, provided the coating thickness is >65 μ . Irradiation results indicate that C-coated oxide microspheres will be satisfactory fuels for high-temp., gas-cooled reactors.

CC 13 (Nuclear Technology)

IT Coating(s)

(of transuranium metal oxide
particles with C)

IT Oxides

(prepn., coating and properties of **sol-gel**
particles of)